

OCD Hobbs
HOBBSOCD

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCT 27 2014

APPLICATION FOR PERMIT TO DRILL OR REENTER **RECEIVED**

1a. Type of Work: ☒ DRILL ☐ REENTER		7. If Unit or CA Agreement, Name and No. Lusk Deep Unit - NMNM 070982X	
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		8. Lease Name and Well No. (30816) Lusk Deep Unit A #27H	
2. Name of Operator COG Operating LLC. (229137)		9. API Well No. 30-025-42209	
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	10. Field and Pool, or Exploratory Lusk; Bone Spring (41440)	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 1980' FSL & 190' FWL Lot #3 (NWSW) SHL Sec 18-T19S-R32E (LX3) At proposed prod. Zone 2180' FSL & 330' FEL Unit Letter I (NESE) BHL Sec 18-T19S-R32E (F)		11. Sec., T.R.M. or Blk and Survey or Area Section 18 - T19S - R32E	
14. Distance in miles and direction from nearest town or post office* Approximately 12 miles from Maljamar		12. County or Parish Lea County	13. State NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 190'	16. No. of acres in lease NMNM0038690: 121.63 NMLC0068947: 120 NMLC0064198A: 160	17. Spacing Unit dedicated to this well 160.81	
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 1284' BHL: 386' Closest to wellbore: 203'	19. Proposed Depth TVD: 9,290' MD: 13,836'	20. BLM/BIA Bond No. on file NMB000740 & NMB000215	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3,584.6' GL	22. Approximate date work will start* 9/1/2014	23. Estimated duration 30 days	

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

- | | |
|---|--|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 6-4-14
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Regulatory Analyst	
Approved by (Signature) Steve Caffey	Name (Printed/Typed) Office CARLSBAD FIELD OFFICE
Title FIELD MANAGER	Date OCT 17 2014

Application approval does not warrant or certify that the applicant holds legan or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

Capitan Controlled Water Basin

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

OCT 28 2014

Surface Use Plan
COG Operating LLC
Lusk Deep Unit A #27H
SHL: 1980' FSL & 190' FWL UL L
Section 18, T19S, R32E
BHL: 2180' FSL & 330' FEL UL I
Section 18, T19S, R32E
Lea County, New Mexico

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OPERATOR CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 4th day of June, 2014.

Signed: Melanie J. Parker

Printed Name: Melanie J. Parker

Position: Regulatory Coordinator

Address: 2208 W. Main Street, Artesia, NM 88210

Telephone: (575) 748-6940

Field Representative (if not above signatory): Rand French

E-mail: mparker@concho.com

COG Operating
DRILLING AND OPERATIONS PROGRAM
Lusk Deep Unit A 27H
SHL: 1980' FSL & 190' FWL of Section 18
BHL: 2180' FSL & 330' FEL of Section 18
Section 18 T19S R32E
Lea County, New Mexico

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In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

Fresh Water	223'	
Rustler	694'	
Salt	774'	
Tansill	2,372'	
Yates	2,555'	
Seven Rivers	2,747'	
Capitan Reef	2,842'	
Queen	3,712'	
Delaware	4,552'	Oil
Bone Springs	6,978'	Oil
FBSG	8,289'	
SBSG	9,037'	
TBSG	9,837'	
TD TVD	9,290'	
TD MD	13,836'	

No other formations are expected to give up oil, gas or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at ~~725'~~^{800'} and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and tying back cement to a minimum of 50' above the Capitan Reef.

3. Proposed Casing Program: All casing is new and API approved

See Corr

Hole Size	Depths	Section	OD Casing	New/Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
17 1/2"	0' - 725' ^{800'}	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 1/4"	0' - 3,500'	Intrmd	9 5/8"	New	36#	BTC	J-55	1.125	1.125	1.6
12 1/4"	3,500' - 4,500'	Intrmd	9 5/8"	New	40#	BTC	J-55	1.125	1.125	1.6
8 3/4"	0' - 13,836'	Production Curve & Lateral	5 1/2"	New	17#	LTC	P-110	1.125	1.125	1.6

While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

4. Proposed Cement Program

a. 13-3/8" Surface

Lead: 400 sx Class C + 4% Gel

(13.5 ppg / 1.75 cuft/sx / 9.2 gal/sk)

Tail: 250 sx Class C + 2% CaCl₂

(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)

**Calculated w/50% excess on OH volumes

b. 9 5/8" Intermediate:

1st Stage:

Lead: 350 sx 35:65:6 C + 5% Salt + 5 pps Gilsonite

(12.7 ppg / 2 cuft/sx / 11.5 gal/sk)

Tail: 250 sx Class C

(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)

2nd Stage: DVT @ 2750'

Lead: 700 sx Class C + 4% Gel

(13.5 ppg / 1.75 cuft/sx / 9.2 gal/sk)

Tail: 100 sx Class C + 1% CaCl_2

(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)

**Calculated w/35% excess on OH volumes

c. 5 1/2" Production:

Lead: 1125 sx 35:65:6 H Blend

(12.7 ppg / 2 cuft/sx / 11.5 gal/sk)

Tail: 1400 sx 50:50:2 H Blend

(14.4 ppg / 1.24 cuft/sx / 6.4 gal/sk)

****Calculated w/35% excess on OH volumes**

- The above cement volumes could be revised pending the caliper measurement.
- The 9-5/8" intermediate string is designed to circulate cement to surface.
- The production string will tie back a minimum of 50' above the Capitan Reef.

5. Pressure Control:

Nipple up on 13 3/8 with annular preventer tested to 2000 psi by independent tester and the rest of the 2M system tested to 2000 psi.

Nipple up on 9 5/8 with 3M system tested to 3000 psi by independent tester.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and a minimum 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 3000 psi WP rating. A remotely operated choke will be installed before drilling out intermediate shoe. If H2S is monitored with 100 ppm in the gas stream while drilling intermediate, we will shut in and install a remote operated choke.

6. Estimated BHP & BHT:

Lateral TD = 4,347 psi

Lateral TD= 148° F

7. Mud Program: The applicable depths and properties of this system are as follows:

Depth	Type System	Mud	Viscosity	Waterloss
		Weight	(sec)	(cc)
0' – 725'	Fresh Water	8.4 – 8.6	29	N.C.
725' – 4,500'	Brine	10-10.2	29	N.C.
4,500' – 13,836'	Cut Brine	8.8 – 9.2	29	N.C.

- The necessary mud products for weight addition and fluid loss control will be on location at all times.
- A visual and electronic mud monitoring system will be rigged up prior to spud to detect changes in the volume of mud system. The electronic system consists of a pit volume total, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with tourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

8. Auxiliary Well Control and Monitoring Equipment:

- A Kelly cock will be in the drill string at all times.
- A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

9. Testing, Logging and Coring Program:

- Drill stem tests will be based on geological sample shows.
- If open hole electrical logging is performed, the program will be:
 - Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
 - Total Depth to Surface: Compensated Neutron with Gamma Ray
 - No coring program is planned
 - Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

10. Potential Hazards:

- No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H2S is anticipated to be encountered.

11. Anticipated starting date and Duration of Operations:

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 35 days.



COG Operating LLC

Lea County New Mexico

Lusk Deep Unit A

Lusk Deep Unit A Well No. 27H

Original hole

SHL: 1980 FSL190 FWL

BHL: 2180 FSL 330 FEL

Plan: rev0

Standard_report

15 May, 2014

THIS DOCUMENT IS THE PROPERTY OF CONCHO OPERATING, L.P. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF CONCHO OPERATING, L.P. ALL RIGHTS ARE RESERVED.



Standard_report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Project		Lea County New Mexico	
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:		Lusk Deep Unit A							
Site Position:		Northing:		599,764.20	usft	Latitude:		32.64763363	
From:		Map	Easting:		670,347.80	usft	Longitude:		-103.77989322
Position Uncertainty:		0.00	Slot Radius:		13-3/16	"	Grid Convergence:		0.30 °

Well:	Lusk Deep Unit A Well No. 27H					
Well Position	+N/-S	0.00 usft	Northing:	603,696.00 usft	Latitude:	32.65858331
	+E/-W	0.00 usft	Easting:	660,099.70 usft	Longitude:	-103.81312430
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,584.60 usft

Wellbore		Original hole			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/15/2014	7.37	60.47	48,558

Design: rev0				
Audit Notes:				
Version:		Phase: PROTOTYPE	Tie On Depth: 0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	89.88

Survey Tool/Program		Date 5/15/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	13,836.14	rev0 (Original hole)	MWD	MWD - Standard



Standard_report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	



Standard_report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	



Standard_report

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5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	



Standard_report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
8,772.54	0.00	0.00	8,772.54	0.00	0.00	0.00	0.00	603,696.00	660,099.70	
KOP Begin 12°/100' build										
8,800.00	3.30	85.50	8,799.98	0.06	0.79	12.00	0.79	603,696.06	660,100.49	
8,814.21	5.00	85.50	8,814.15	0.14	1.81	12.00	1.81	603,696.14	660,101.51	
8,900.00	15.30	85.50	8,898.49	1.33	16.86	12.00	16.86	603,697.33	660,116.56	
9,000.00	27.30	85.50	8,991.49	4.17	53.00	12.00	53.01	603,700.17	660,152.70	
9,100.00	39.30	85.50	9,074.93	8.46	107.63	12.00	107.64	603,704.46	660,207.33	
9,200.00	51.30	85.50	9,145.14	14.02	178.35	12.00	178.38	603,710.02	660,278.05	
9,300.00	63.30	85.50	9,199.08	20.61	262.09	12.00	262.13	603,716.61	660,361.79	
9,400.00	75.30	85.50	9,234.37	27.93	355.17	12.00	355.23	603,723.93	660,454.87	
9,500.00	87.30	85.50	9,249.47	35.66	453.53	12.00	453.61	603,731.66	660,553.23	
9,520.75	89.79	85.50	9,250.00	37.29	474.21	12.00	474.29	603,733.29	660,573.91	
Begin 89.79° lateral										
9,600.00	89.79	85.50	9,250.30	43.50	553.22	0.00	553.31	603,739.50	660,652.92	
9,700.00	89.79	85.50	9,250.67	51.34	652.91	0.00	653.01	603,747.34	660,752.61	
9,800.00	89.79	85.50	9,251.05	59.18	752.60	0.00	752.72	603,755.18	660,852.30	
9,900.00	89.79	85.50	9,251.42	67.02	852.29	0.00	852.43	603,763.02	660,951.99	
10,000.00	89.79	85.50	9,251.80	74.86	951.98	0.00	952.14	603,770.86	661,051.68	
10,100.00	89.79	85.50	9,252.17	82.69	1,051.68	0.00	1,051.85	603,778.69	661,151.38	
10,200.00	89.79	85.50	9,252.55	90.53	1,151.37	0.00	1,151.55	603,786.53	661,251.07	



Standard_report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	D Leg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
10,300.00	89.79	85.50	9,252.92	98.37	1,251.06	0.00	1,251.26	603,794.37	661,350.76	
10,400.00	89.79	85.50	9,253.30	106.21	1,350.75	0.00	1,350.97	603,802.21	661,450.45	
10,500.00	89.79	85.50	9,253.68	114.05	1,450.44	0.00	1,450.68	603,810.05	661,550.14	
10,600.00	89.79	85.50	9,254.05	121.89	1,550.13	0.00	1,550.38	603,817.89	661,649.83	
10,700.00	89.79	85.50	9,254.43	129.73	1,649.82	0.00	1,650.09	603,825.73	661,749.52	
10,800.00	89.79	85.50	9,254.80	137.57	1,749.52	0.00	1,749.80	603,833.57	661,849.22	
10,900.00	89.79	85.50	9,255.18	145.41	1,849.21	0.00	1,849.51	603,841.41	661,948.91	
11,000.00	89.79	85.50	9,255.55	153.24	1,948.90	0.00	1,949.22	603,849.24	662,048.60	
11,100.00	89.79	85.50	9,255.93	161.08	2,048.59	0.00	2,048.92	603,857.08	662,148.29	
11,200.00	89.79	85.50	9,256.30	168.92	2,148.28	0.00	2,148.63	603,864.92	662,247.98	
11,300.00	89.79	85.50	9,256.68	176.76	2,247.97	0.00	2,248.34	603,872.76	662,347.67	
11,400.00	89.79	85.50	9,257.05	184.60	2,347.67	0.00	2,348.05	603,880.60	662,447.37	
11,500.00	89.79	85.50	9,257.43	192.44	2,447.36	0.00	2,447.75	603,888.44	662,547.06	
11,520.75	89.79	85.50	9,257.51	194.07	2,468.04	0.00	2,468.44	603,890.07	662,567.74	
Begin 2°/100' turn										
11,600.00	89.78	87.09	9,257.80	199.18	2,547.12	2.00	2,547.54	603,895.18	662,646.82	
11,700.00	89.79	89.09	9,258.18	202.52	2,647.06	2.00	2,647.48	603,898.52	662,746.76	
11,739.49	89.79	89.88	9,258.33	202.87	2,686.55	2.00	2,686.97	603,898.87	662,786.25	
Begin 89.79° lateral										
11,800.00	89.79	89.88	9,258.55	203.00	2,747.06	0.00	2,747.48	603,899.00	662,846.76	
11,900.00	89.79	89.88	9,258.93	203.21	2,847.06	0.00	2,847.48	603,899.21	662,946.76	
12,000.00	89.79	89.88	9,259.30	203.42	2,947.06	0.00	2,947.48	603,899.42	663,046.76	
12,100.00	89.79	89.88	9,259.68	203.64	3,047.06	0.00	3,047.48	603,899.64	663,146.76	
12,186.22	89.79	89.88	9,260.00	203.82	3,133.28	0.00	3,133.70	603,899.82	663,232.98	
Begin 2°/100' drop										
12,200.00	89.51	89.88	9,260.08	203.85	3,147.06	2.00	3,147.48	603,899.85	663,246.76	
12,228.09	88.95	89.88	9,260.46	203.91	3,175.14	2.00	3,175.56	603,899.91	663,274.84	
Begin 88.95° lateral										



Standard_report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V:Sec (usft)	Northing (usft)	Easting (usft)
12,300.00	88.95	89.88	9,261.78	204.06	3,247.04	0.00	3,247.46	603,900.06	663,346.74
12,400.00	88.95	89.88	9,263.62	204.27	3,347.02	0.00	3,347.45	603,900.27	663,446.72
12,500.00	88.95	89.88	9,265.46	204.48	3,447.01	0.00	3,447.43	603,900.48	663,546.71
12,600.00	88.95	89.88	9,267.29	204.69	3,546.99	0.00	3,547.41	603,900.69	663,646.69
12,700.00	88.95	89.88	9,269.13	204.90	3,646.97	0.00	3,647.39	603,900.90	663,746.67
12,800.00	88.95	89.88	9,270.97	205.11	3,746.96	0.00	3,747.38	603,901.11	663,846.66
12,900.00	88.95	89.88	9,272.80	205.32	3,846.94	0.00	3,847.36	603,901.32	663,946.64
13,000.00	88.95	89.88	9,274.64	205.54	3,946.92	0.00	3,947.34	603,901.54	664,046.62
13,100.00	88.95	89.88	9,276.47	205.75	4,046.90	0.00	4,047.33	603,901.75	664,146.60
13,200.00	88.95	89.88	9,278.31	205.96	4,146.89	0.00	4,147.31	603,901.96	664,246.59
13,300.00	88.95	89.88	9,280.15	206.17	4,246.87	0.00	4,247.29	603,902.17	664,346.57
13,400.00	88.95	89.88	9,281.98	206.38	4,346.85	0.00	4,347.28	603,902.38	664,446.55
13,500.00	88.95	89.88	9,283.82	206.59	4,446.84	0.00	4,447.26	603,902.59	664,546.54
13,600.00	88.95	89.88	9,285.66	206.80	4,546.82	0.00	4,547.24	603,902.80	664,646.52
13,700.00	88.95	89.88	9,287.49	207.01	4,646.80	0.00	4,647.23	603,903.01	664,746.50
13,800.00	88.95	89.88	9,289.33	207.22	4,746.79	0.00	4,747.21	603,903.22	664,846.49
13,836.52	88.95	89.88	9,290.00	207.30	4,783.30	0.00	4,783.72	603,903.30	664,883.00
PBHL/TD									



Standard_report

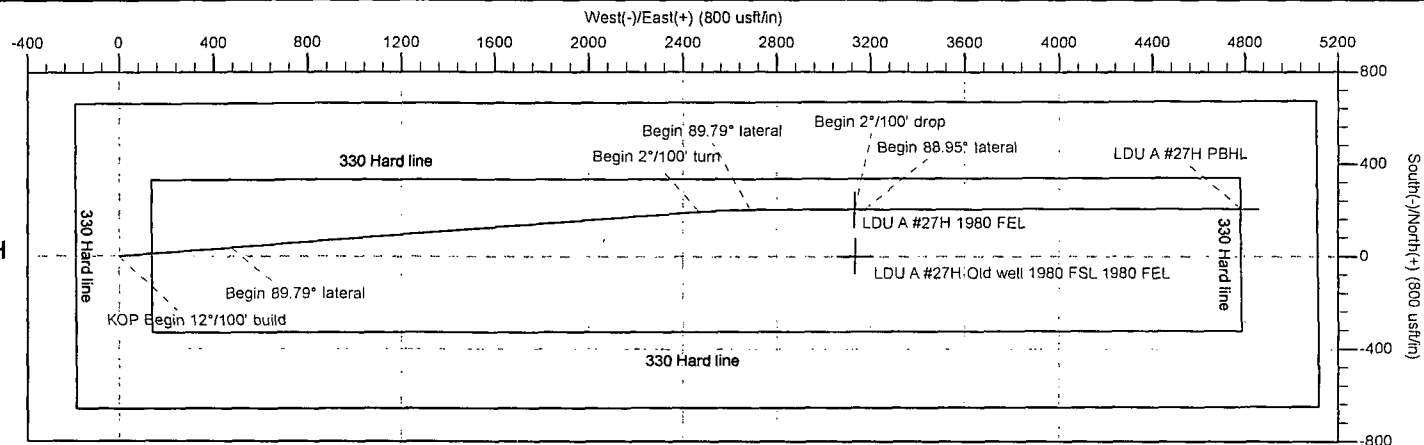
Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 27H
Project:	Lea County New Mexico	TVD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3584.6+18 @ 3602.60usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 27H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,772.54	8,772.54	0.00	0.00	KOP Begin 12°/100' build
9,520.75	9,250.00	0.14	1.81	Begin 89.79° lateral
11,520.75	9,257.51	37.29	474.21	Begin 2°/100' turn
11,739.49	9,258.33	194.07	2,468.04	Begin 89.79° lateral
12,186.22	9,260.00	202.87	2,686.56	Begin 2°/100' drop
12,228.09	9,260.46	203.82	3,133.27	Begin 88.95° lateral
13,836.52	9,290.00	203.91	3,175.15	PBHL/TD



COG Operating LLC

Well: Lusk Deep Unit A Well No. 27H
 Site: Lusk Deep Unit A
 Project: Lea County New Mexico
 Design: rev0
 Rig: Patriot 6

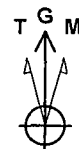


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8772.54	0.00	0.00	8772.54	0.00	0.00	0.00	0.00	0.00	KOP Begin 12"/100' build
3	8814.21	5.00	85.50	8814.15	0.14	1.81	12.00	85.50	1.81	
4	9520.75	89.79	85.50	9250.00	37.29	474.21	12.00	0.00	474.29	Begin 89.79° lateral
5	11520.75	89.79	85.50	9257.51	194.07	2468.04	0.00	0.00	2468.44	Begin 2"/100' turn
6	11739.49	89.79	89.88	9258.33	202.87	2686.56	2.00	90.00	2686.97	Begin 89.79° lateral
7	12186.22	89.79	89.88	9260.00	203.82	3133.27	0.00	0.00	3133.69	Begin 2"/100' drop
8	12228.09	88.95	89.88	9260.46	203.91	3175.15	2.00	179.99	3175.57	Begin 88.95° lateral
9	13836.52	88.95	89.88	9290.00	207.30	4783.30	0.00	0.00	4783.72	PBHL/TD

Surface Location: RKB=3584.6+18 @ 3602.60usft (Patriot 6)
 US State Plane 1927 (Exact solution)
 New Mexico East 3001

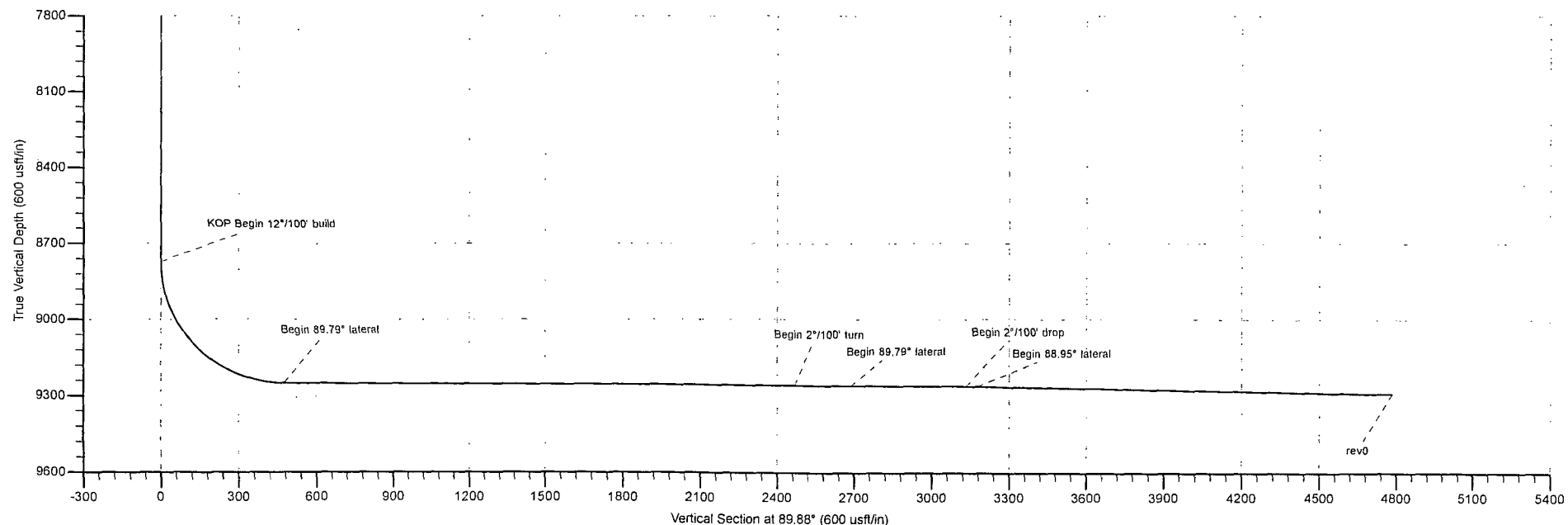
Northing: 603696.00 Easting: 660099.70 Latitude: 32.65858331 Longitude: -103.81312430
 Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Add 7.09°



Azimuths to Grid North
 True North: -0.28°
 Magnetic North: 7.09°

Magnetic Field
 Strength: 48558.4snT
 Dip Angle: 60.47°
 Date: 5/15/2014
 Model: IGRF2010

N=ONE



LLD ACREAGE REPORT

Admin State: NM

Geo State: NM

MTR: 23 0190S 0320E

Section: 018

<u>Sur Type</u>	<u>Sur No</u>	<u>Lld Suff</u>	<u>NE</u> <u>NW</u> <u>SW</u> <u>SE</u> <u>NNSS</u> <u>NNSS</u> <u>NNSS</u> <u>NNSS</u> <u>EWWE</u> <u>EWWE</u> <u>EWWE</u> <u>EWWE</u>	<u>Sur Note</u>	<u>Dup</u> <u>Flg</u>	<u>Sub</u> <u>Surf</u>	<u>Acreage</u>
A			XXXX X--X X--X XXXX				480.000
L	1		---- -X-- ----				40.800
L	2		---- --X- ----				40.810
L	3		---- ---- -X-- ----				40.810
L	4		---- ---- --X- ----				40.820

Section 018 Total: 643.240

MTR Total Excluding Survey Notes C/D/R
and Sub Surf = Y 643.240Grand Total Excluding Survey Notes C/D/R
and Sub Surf = Y: 643.240



New Mexico Office of the State Engineer **Water Column/Average Depth to Water**

No records found.

PLSS Search:

Section(s): 18

Township: 19S

Range: 32E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



New Mexico Office of the State Engineer Water Column/Average Depth to Water

(A CLW##### in the
POD suffix indicates the
POD has been replaced
& no longer serves a
water right file.)

(R=POD has
been replaced,
O=orphaned,
C=the file is
closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	64	16	4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00073	LE			2	4	34	19S	32E		617502	3609301*	575		
CP 00075	LE			2	4	34	19S	32E		617502	3609301*	575		
CP 00563	LE			1	1	2	19	19S	32E	612118	3613376*	300		
CP 00639	LE			3	1	20	19S	32E		613029	3612880*	350	345	5
CP 00640	LE			2	2	19	19S	32E		612621	3613280*	260	102	158

Average Depth to Water: **223 feet**

Minimum Depth: **102 feet**

Maximum Depth: **345 feet**

Record Count: 5

PLSS Search:

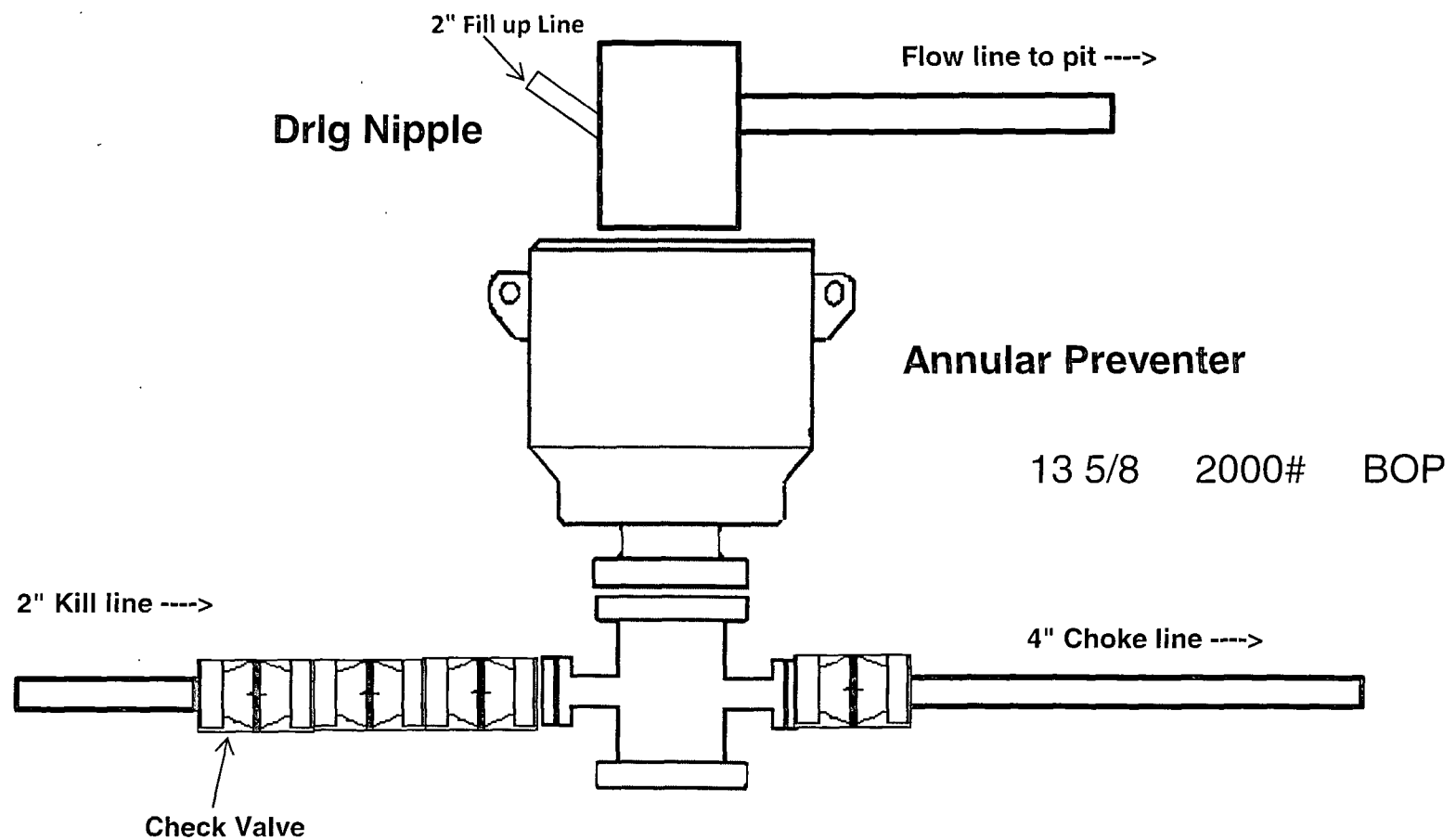
Township: 19S

Range: 32E

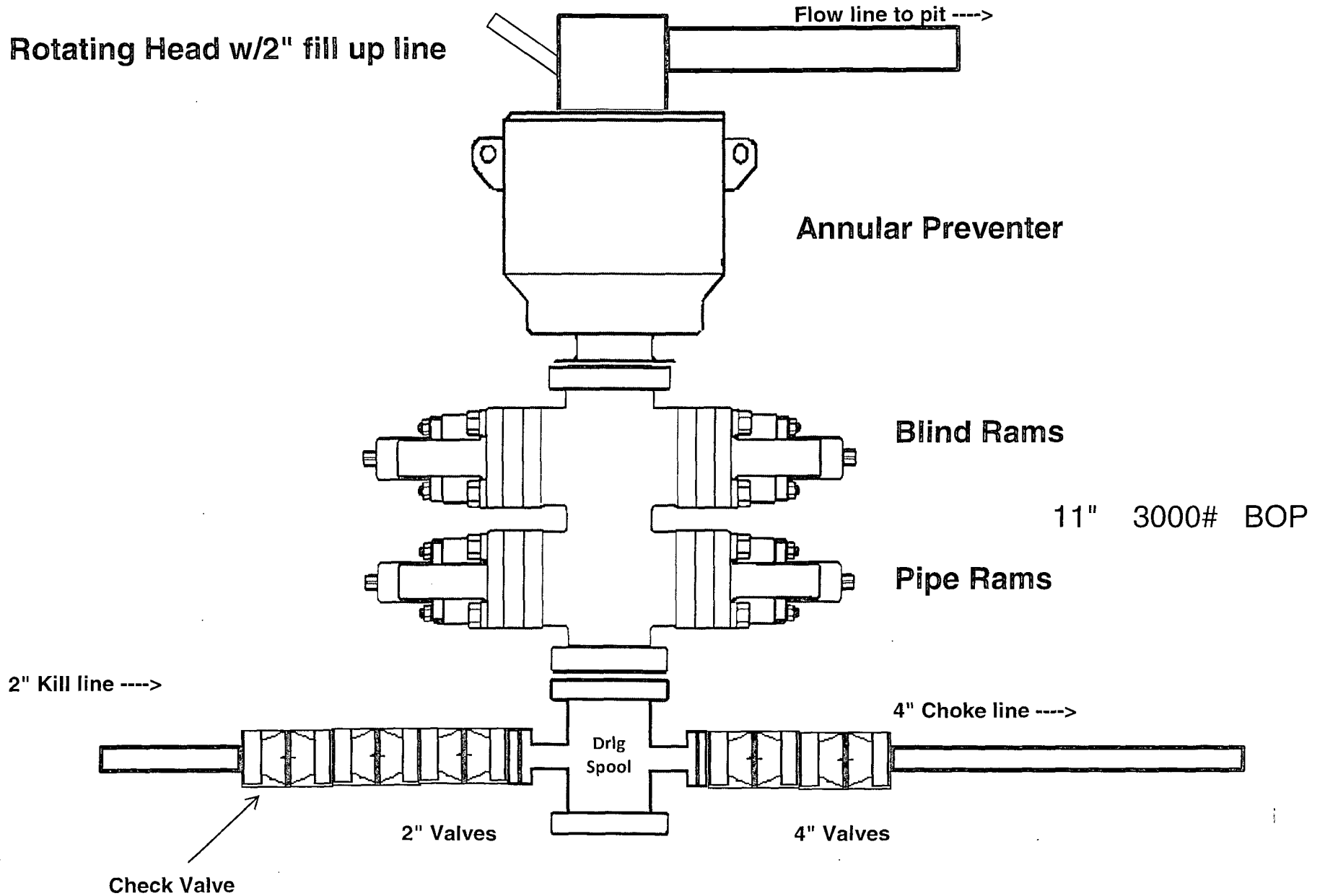
*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

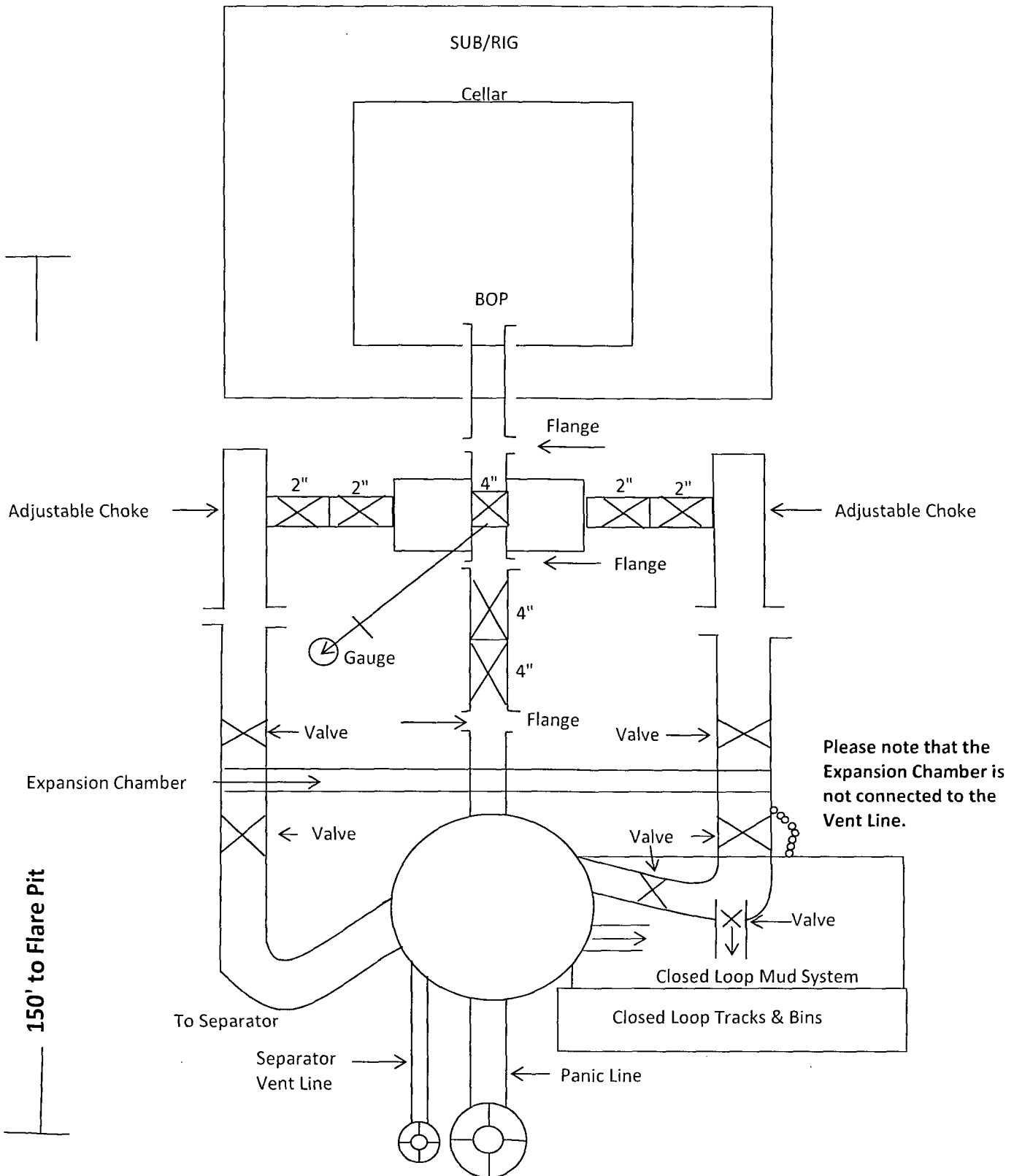
2,000 psi BOP Schematic



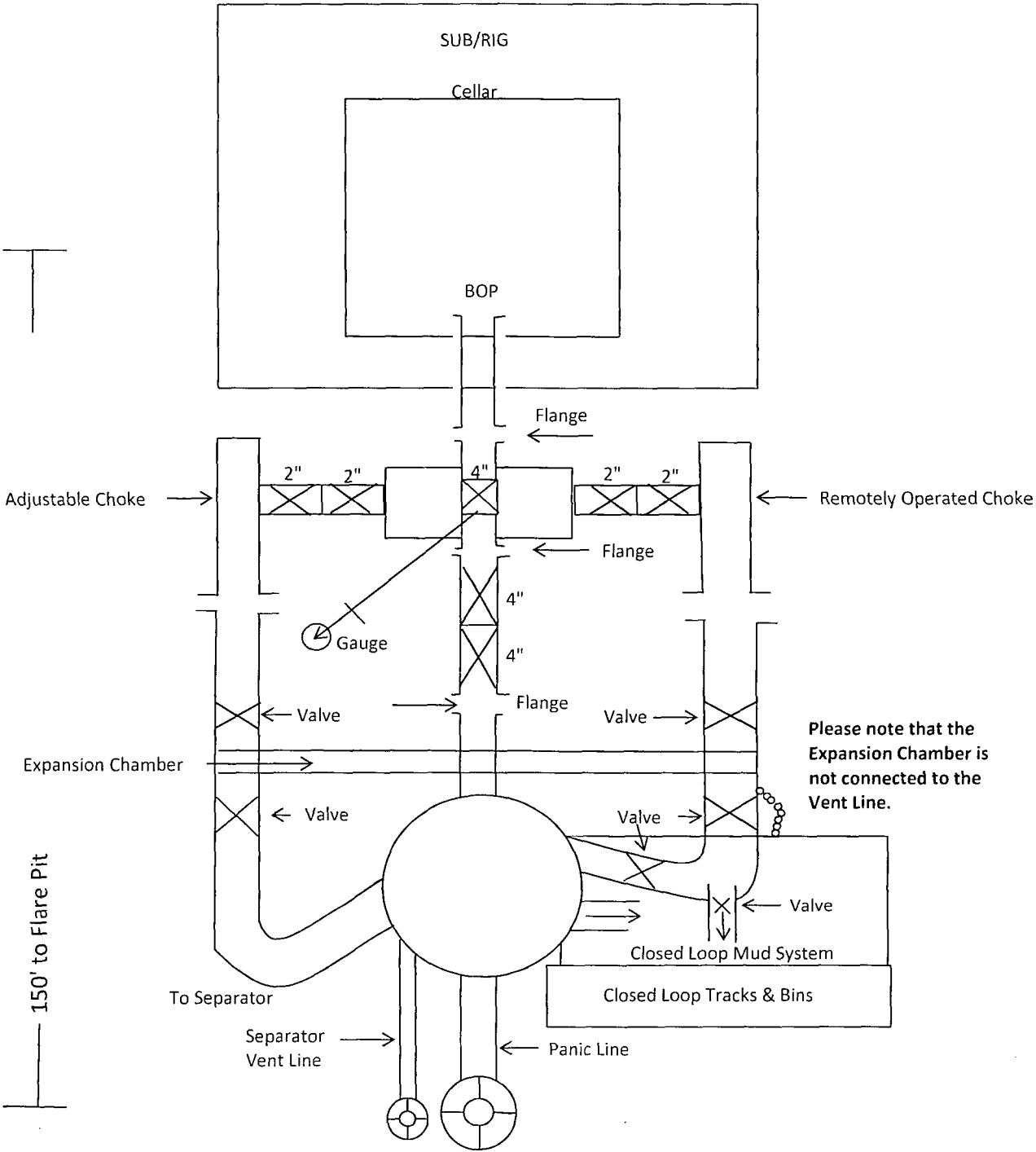
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram

Well pad will be 340' X 340'
with cellar in center of pad

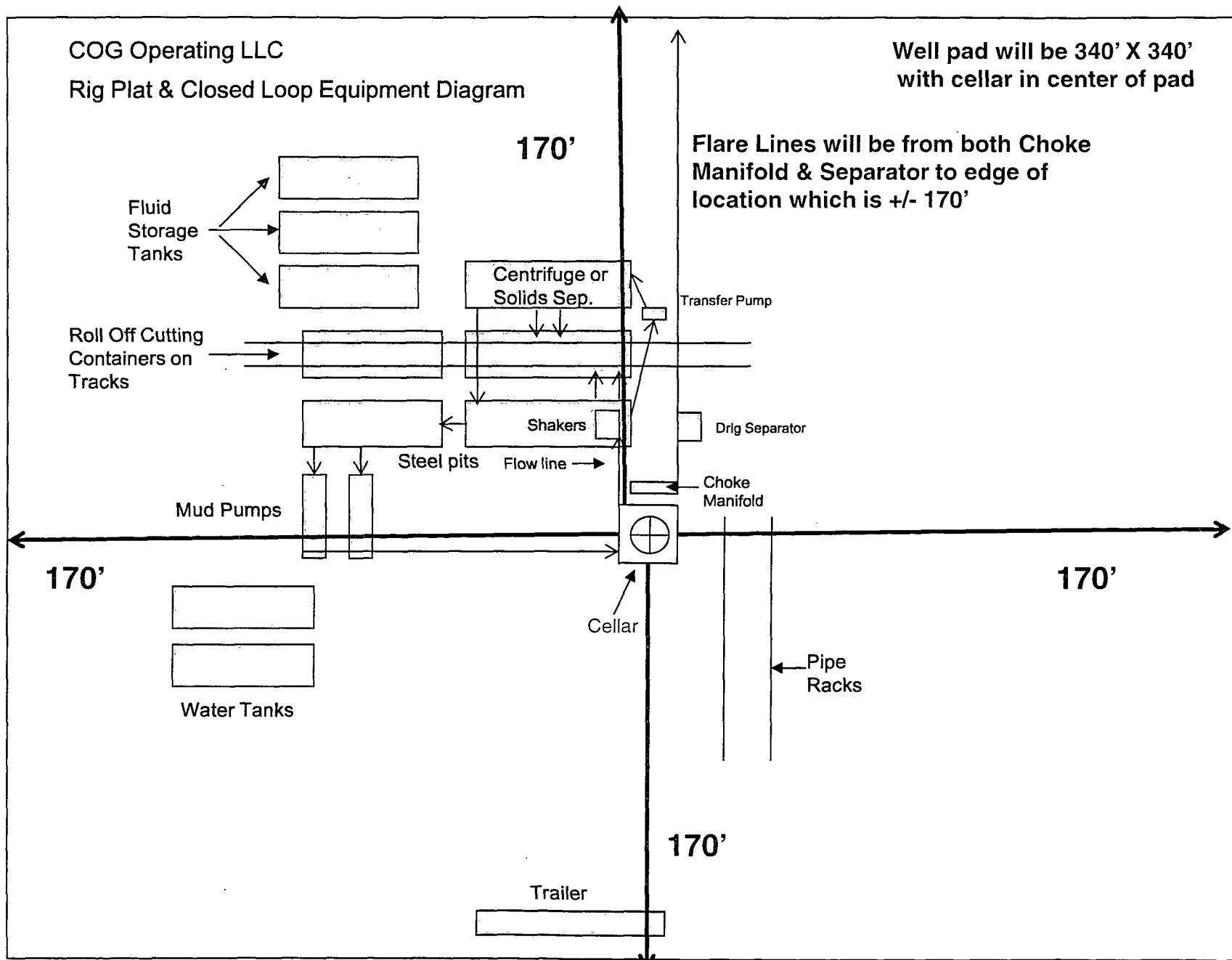
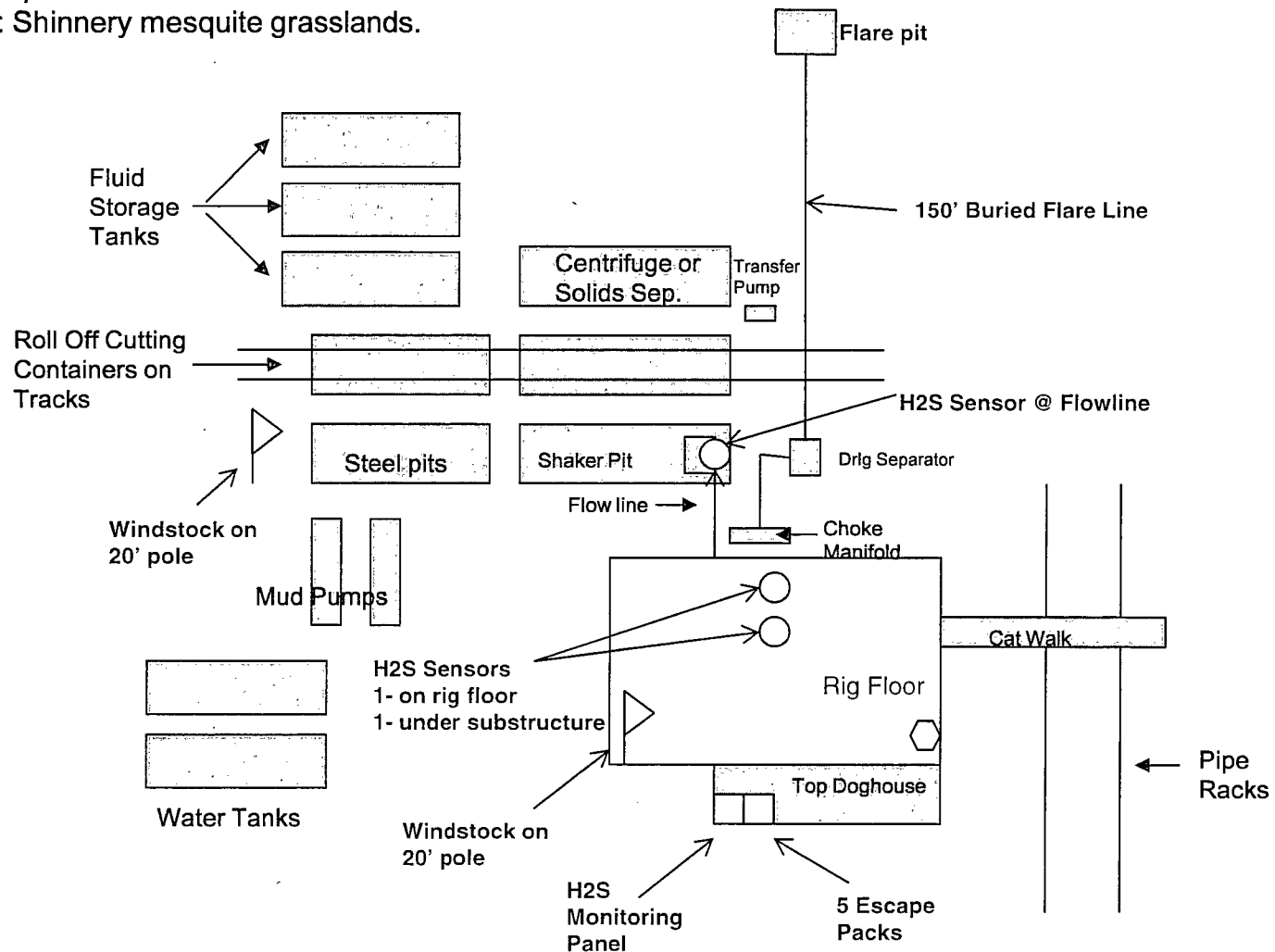


Exhibit 1

"I further certify that COG will comply with Rule 19.15.17
NMAC by using a Closed Loop System."

COG Operating, LLC
H₂S Equipment Schematic
Terrain: Shinnery mesquite grasslands.

Well pad will be 340' X 340'
with cellar in center of pad



Location Entry
Condition Sign

Briefing Area
w/SCBA

N

Prevailing Wind
Direction in SENM

Secondary Egress

Company Representative's Trailer

Primary Briefing
Area w/SCBA